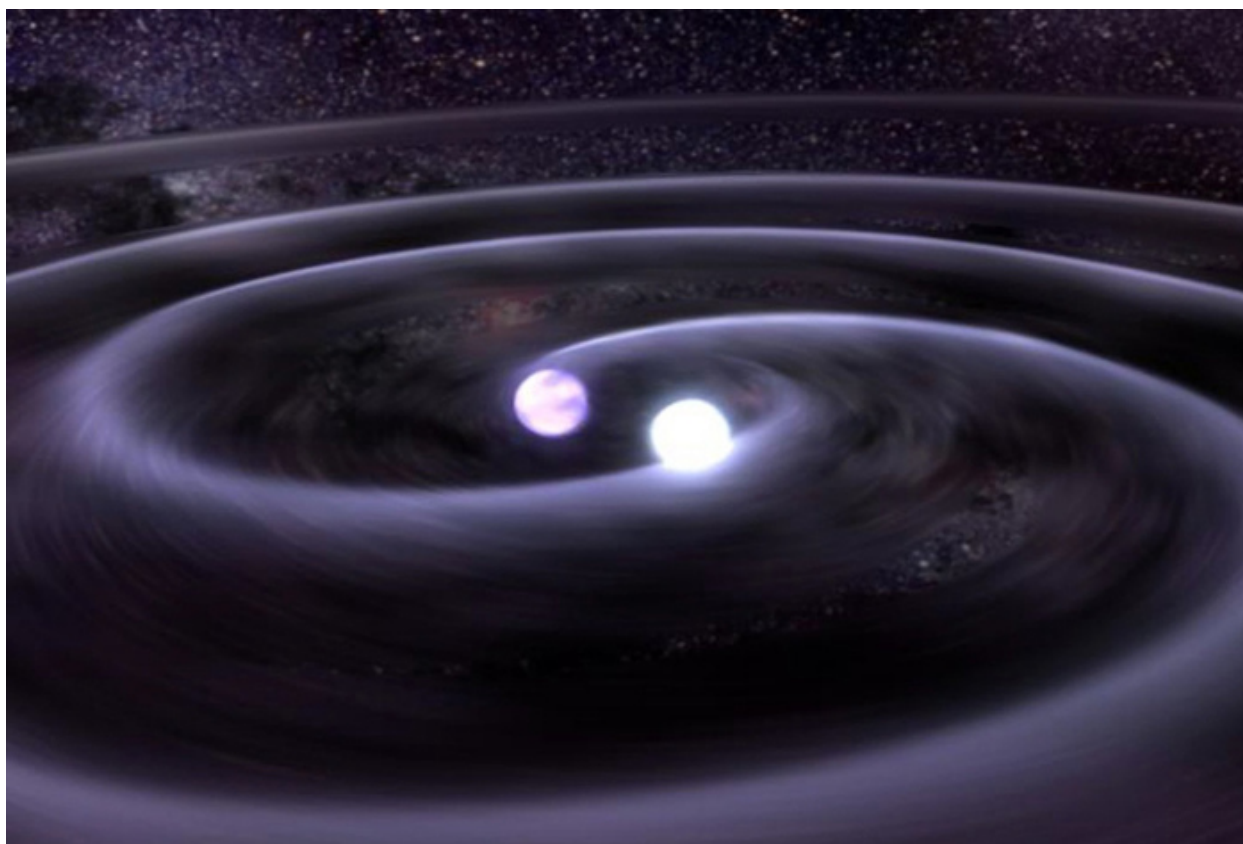




What do you get when two neutron stars merge?

November 8, 2015



[What do you get when two neutron stars merge?](http://aasnova.org)

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The merger of two neutron stars (a NS–NS merger) is suspected to be the most likely source of short-duration gamma-ray bursts (GRBs) — powerful explosions that can be seen from billions of light-years away. But whether a GRB is launched is dependent on what remnant is created by the merging NSs. Do they form another NS? Or a black hole (BH)?

Uncertain Remnant

If the NS–NS merger forms a BH remnant, a GRB can be launched during the ensuing accretion. But if it instead forms a NS, a GRB may only be launched if the remnant

collapses to a BH within 100 milliseconds; any longer, and theory says that the GRB jet will become loaded with baryons and choke.

Unfortunately, determining whether the merger will produce a NS or a BH is difficult. A major limitation is that we don't know what equation of state describes the interior of a NS — which means we also don't know what maximum mass a NS can have before it collapses into a BH.

Led by Chris Fryer of the University of Arizona and the Los Alamos National Laboratory, a group of researchers undertook a highly collaborative study to better understand the fates of NS–NS mergers.

By [Susanna Kohler](#) on October 28, 2015

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